



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,281	11/19/2003	Teruhiko Nawata	1217-032245	7413

28289 7590 08/28/2006

THE WEBB LAW FIRM, P.C.
700 KOPPERS BUILDING
436 SEVENTH AVENUE
PITTSBURGH, PA 15219

EXAMINER

NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
----------	--------------

1754

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/717,281	Applicant(s) NAWATA ET AL.	
	Examiner Ngoc-Yen M. Nguyen	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 11-021,197.

JP '197 discloses a process for producing fluoride single crystal (note title). The fluoride single crystal is formed by Czochralski method using a seed crystal (note

Art Unit: 1754

paragraph 0011). The fluoride can be calcium fluoride, barium fluoride or magnesium fluoride (note paragraph 0012). The seed crystal can have the main crystal growth plane in the {111} or {100} plane (note paragraph 0010). The single crystal can have a diameter of 25 cm and a thickness of 50 mm (note paragraph 0090).

In the process of JP '197 the pulling rate is 0.5 to 1 mm/hr (note paragraph 0103) and the apparatus used in JP '197 has a means 302 to prevent the heat from the heater 303 from going up (just as the lid 14 in the claimed invention, note instant specification, page 20, lines 1-3).

Since the process of JP '197 uses a slow pulling rate, which is well within the rate used in the claimed invention (i.e., less than 4 mm/hr, note instant specification, page 14, lines 12-21) and has a means to prevent the heat from the heater from going up as discussed above, the as-grown single crystal product of JP '197 would inherently have the same light transmittance as that of the claimed product.

The product of JP '197 is subjected to an anneal treatment (note paragraph [0052] or [0090]).

The product of JP '197 anticipates the claimed product.

Alternatively, the process limitation of "as grown" in claims 1-14 are noted. However, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

Art Unit: 1754

Claims 1, 3, 5, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al (2004/0099205) in view of the admitted prior art on page 2-3 and JP 2000-272,990.

Li discloses a calcium fluoride crystal for making optical elements for transmitting below 200 nm ultraviolet light having a [100] crystallographic orientation and a diameter greater than or equal to about 250 mm (note claim 23).

For product by process limitation, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

The difference is Li does not specifically disclose the light transmittance, as measured at a wavelength of 632.8 nm

The admitted prior art on pages 2-3 fairly teaches that when crucible depression method, which is the same method used in Li '205, is used to produce single crystal, the peripheral surface of the resulting single crystal becomes opaque because the single crystal is formed in such a stated that the inner wall of the crucible is in contact with a liquid surface of the starting material melt (note paragraph bridging pages 2-3 of the instant specification).

JP '990 discloses a crucible which does not contaminate a grown crystals and does not have a site to be used as a nucleus for growing a crystal, i.e. no polycrystal would be formed (note English abstract). The inner surface roughness of the crucible

Art Unit: 1754

is minimized and the crucible is made out of pyrolytic graphite in order to produce high purity single crystals.

It would have been obvious to one skilled in the art to use a crucible as suggested by JP '990 for the process of producing single crystal as disclosed in Li '205 because such crucible would minimize the formation of any polycrystal the surface of the single crystal and high purity single crystals would be formed to inherently have high light transmittance at 632.8 nm wavelength.

Claims 1, 4, 5, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma et al (6,332,922) or Garibin et al (6,673,150), either one in view of the admitted prior art on pages 2-3 and JP '990.

Sakuma '922 discloses a single crystal of calcium fluoride with a large diameter (20 cm or greater) having superior optical property, which can be used for photolithography with a wavelength of 230 nm or less, was manufactured by annealing calcium fluoride with a size of 210 mm x 52 mm (note column 13, lines 5-15).

The superior optical property as stated above fairly teaches that the light transmittance at a high wavelength, such as 632.8 nm, as required in the instant claim 1, would inherently be very high.

Alternatively, Garibin '150 discloses a calcium fluoride monocrystal with diameter of 300 mm (= 30 cm) and a thickness of 70 mm (= 7 cm) (note column 4, lines 20-22).

Art Unit: 1754

The product of Garibin is used for transmitting UV region light below 200 nm (note column 1, lines 15-19).

The process limitation of "as-grown" is noted. However, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

The difference is Sakuma '922 or Garibin '150 does not disclose the light transmittance at a wavelength of 632.8 nm.

The admitted prior art on pages 2-3 and JP '990 are applied as stated in the above rejection.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li '205 in view of the admitted prior art on pages 2-3, JP '990 and further in view of JP '197.

Li '205, the admitted prior art on pages 2-3 and JP '990 are applied as stated in the above rejection.

Li '205 also teaches that beside the exemplified single crystal having [100] crystallographic orientation, high quality [111] oriented calcium fluoride single crystals are also needed (note paragraph 0006).

Art Unit: 1754

Li '205 does not specifically disclose the thickness of the single crystal or other fluoride beside calcium fluoride.

JP '197 discloses fluoride single crystal products as stated in the above rejection. JP '197 teaches that the single crystal product is desired to have a thickness of 50 mm and the process for making calcium fluoride single crystal can be used to form other alkaline earth metal fluoride single crystal such as barium fluoride and magnesium fluoride.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to produce calcium fluoride or other alkaline earth metal fluoride by using the invention of Li '205 having a thickness of 50 mm, as suggested by JP '197 because such thickness is desired in the art.

Applicant's arguments filed June 7, 2006 have been fully considered but they are not persuasive.

Applicants urge that claim 1 has been amended to clarify that the claimed crystal is not annealed.

The limitation of "non-annealed" is considered as a "product-by-process" limitation.

Applicants urge that the Declaration shows the light transmittance of JP '197 is not the same as required in the instant claims.

It is noted that in the Declaration, the comparative examples are done to show that when the barrier 13 was not used (as in JP '197), the light transmittance at 632.8

Art Unit: 1754

nm is not the same when the barrier was used. However, the final product of JP '197 is a single crystal which has been subjected to an anneal step. There is no comparative example to show the final product of JP '197 would not have the same light transmittance. As for the "as grown" and "non-annealed", they are considered as product-by-process limitations, note In re Fessmann, In re Brown as stated above. Applicants have not provided any evidence to show that the annealed product as disclosed in JP '197 does not have the required light transmittance or the claimed product is structurally or physically different than the product of JP '197.

Applicants argue that nothing in JP '197 would suggest that a non-annealed crystal having the claimed high light transmittance could be produced.

Again, Applicants' claims are drawn to a product, not a process for making the product. For the product-by-process limitations, note again In re Fessmann, In re Brown as stated above.

Applicants argue that there is no support for the correlation between freedom from contamination and light transmittance.

As taught in the admitted prior art on pages 2-3, "the peripheral surface of the resulting single crystal becomes opaque because the single crystal is formed in such a stated that the inner wall of the crucible is in contact with a liquid surface of the starting material melt" (note page 3, lines 1-5). This fairly teaches the contact between the inner wall of the crucible and the liquid surface causes some kind of contamination which in turn causing the single crystal to become opaque. Thus, when a new and improved

crucible, as suggested by JP '990, is used in the process of Li '205, the contamination problem would no longer present and the problem of opaqueness would be prevented.

The other rejections are maintained for the same reasons as stated above.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

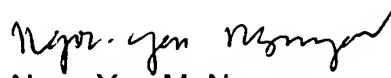
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

Art Unit: 1754

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stanley Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 or (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.


Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

nmn
August 21, 2006